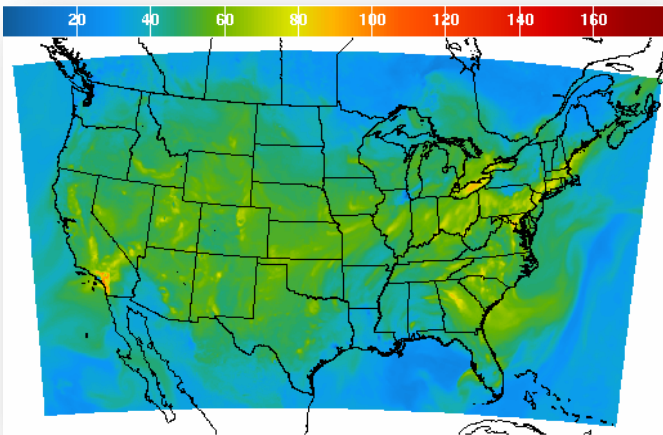




# Air Resources Laboratory

Understanding air as part of the total environment

## What Does the Air Resources Laboratory Do for the Nation?



An example map of ground-level ozone concentrations predicted for the continental U.S. NOAA's National Weather Service generates such maps twice daily using an ARL-developed modeling system. (Image: NOAA)

NOAA's Air Resources Laboratory (ARL) provides research and development for air quality, atmospheric dispersion, climate, and other atmospheric issues. ARL's goal is to improve the Nation's ability to protect human and ecosystem health while also maintaining a vibrant economy. Key activities include developing, evaluating, and applying models of ozone and particulate matter; improving approaches for predicting atmospheric dispersion of hazardous materials; generating new insights into air-surface exchange and climate variability and trends; and advancing the understanding of and ability to predict the behavior of the planetary boundary layer (the layer of the atmosphere closest to the ground).

## Recent Accomplishments

**Benefit:** The public is better informed about the movement of pollutants and other potentially harmful substances for which actions can be taken to reduce health impacts.

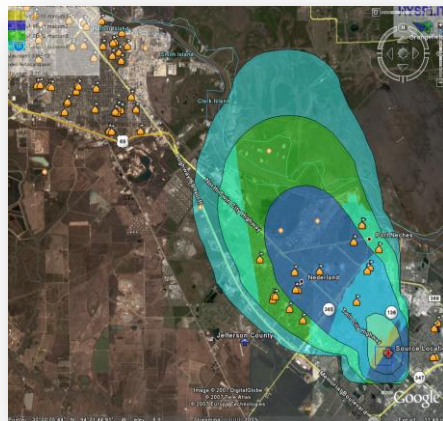
ARL developed and delivered air quality and atmospheric dispersion models to the National Weather Service to support operational air quality prediction and emergency response.

**Benefit:** Decision-makers are equipped with the information necessary to effectively reduce mercury levels in food, improving public health, and supporting recreational and commercial fishing.

ARL developed observation protocols to measure mercury in the air and its deposition on land. The lab deployed advanced mercury monitoring instruments in Maryland, West Virginia, Mississippi, and Pennsylvania. Modeled sources and destinations of atmospheric mercury.

**Benefit:** Better characterization of climate variability and trends to inform policy-makers.

ARL corrected inconsistencies in the historical record of observations from balloon-borne radiosondes and analyzed climate trends. ARL deployed the Climate Reference Network in the continental U.S., which consists of 114 stations. The Climate Reference Network will provide highly accurate and reliable measurements of climate change.



The ARL plume model, called HYSPLIT, is being updated to simulate local Hazmat incidents and is being considered for operational use by the National Weather Service (NWS). The updated model is the result of a collaboration among ARL, the NWS, and the National Ocean Service. (Image: NOAA)



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## More Accomplishments

**Benefit: Improved information that protects people who live, work, and attend school near busy highways.**

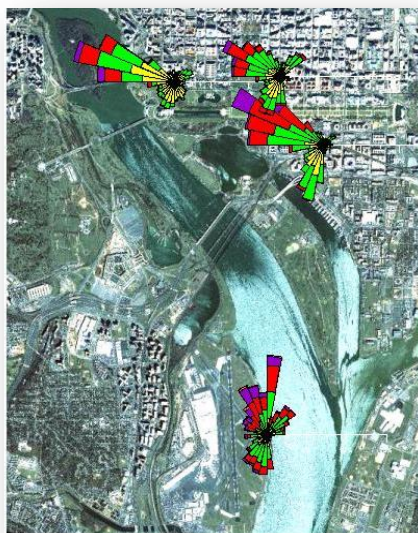
Conducted a study of how the wind transports pollutants around roadway sound barriers.

**Benefit: More accurate and reliable information to evaluate and predict climate change.**

Helped lead an international team developing the Global Climate Observing System Reference Upper Air Network.



Evaluating instrumentation at the Climate Reference Network site in Colorado. Photo: NOAA



Meteorological towers deployed across Washington, D.C., serve as a first phase of an evolving urban atmospheric research program. High quality wind data augment data from Reagan National Airport, and are used to drive computer models to better predict movement of hazardous substances and to track severe weather. (Image: NOAA)

## What's Next for ARL?

### Scientific challenges in the next 5 to 10 years:

- Improve numerical models of particulate matter and ozone concentrations to support better air quality forecasts.
- Better predictions of airborne dispersion of hazardous materials in urban areas to support a more effective response to their release.
- Develop and apply methods for measuring deposition of ecologically important substances, such as nitrogen and mercury, on sensitive ecosystems and for determining the sources of those substances. This will provide essential information for evaluating and revising air quality and environmental management approaches.
- Continue improving the measurement and assessment of climate variability and change to inform national and international policies.

## Did You Know?



Photo: NOAA

ARL's Hybrid Single Particle Lagrangian Integrated Trajectory (HYSPLIT) model is used by multiple federal agencies and thousands of people around the world to predict the transport and dispersion of a wide range of atmospheric materials. Applications include radioactive releases, volcanic ash, wildfire smoke, large chemical spills, and windborne dust.

## Research Partnerships

ARL works in partnership with universities, non-governmental organizations, and other federal agencies, including the U.S. Environmental Protection Agency and the Departments of Energy, Homeland Security, and Defense.

## Budget and Staff

The fiscal year 2010 enacted budget for the ARL is \$5.4M. The fiscal year 2011 President's budget request for ARL is \$5.6M. The fiscal year 2010 President's budget request for ARL was \$5.4M. ARL's direct appropriation supports 28 permanent full time employees. Additional funds from other NOAA offices and federal partners support an additional 17 permanent full time employees. Our employees are based in Silver Spring (MD), Idaho Falls (ID), Las Vegas (NV), and Oak Ridge (TN).

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